

CLAIMS

1. A linerless metallic closure for a container having an opening with a rim, said linerless metallic closure comprising:

a metal closure shell having a top portion and an annular side wall; and

5 a foamed material layer deposited over an inside surface of said top portion such that application of said closure to said container hermetically seals said container by a contact between a portion of said foamed material layer on said top circular portion and said rim.

10 2. The linerless metallic closure of claim 1, wherein said foamed material layer is deposited over said inside surface of said top portion and an inside surface of said side wall.

15 3. The linerless metallic closure of claim 1, wherein said metal closure shell is one of steel, and aluminum.

4. The linerless metallic closure of claim 1, wherein said metal closure shell is one of a crown cap, and a roll-on cap.

20 5. The linerless metallic closure of claim 1, wherein said metal closure shell further comprises at least one varnish coating thereon.

25 6. The linerless metallic closure of claim 1, wherein a composition of said foamed material layer comprises a vinyl resin, a plasticizer, and a blowing agent.

7. The linerless metallic closure of claim 1, wherein the thickness of said foamed material layer is between about 0.010 and about 0.020 inches.

30 8. The linerless metallic closure of claim 7, wherein the thickness of said foamed material layer is about 0.015 inches.

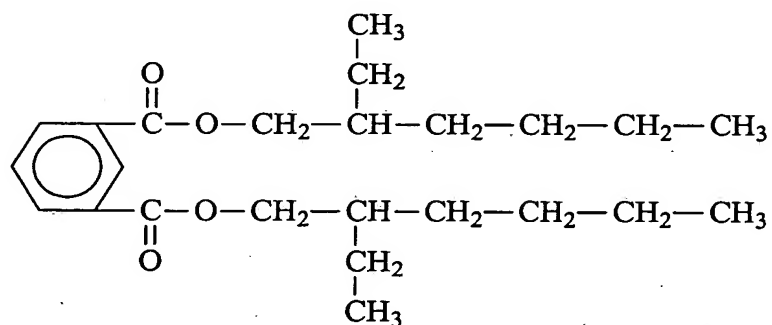
9. The linerless metallic closure of claim 6, wherein said vinyl resin is a polyvinyl chloride having a concentration in said composition ranging from about 40 to about 50% by weight.

5 10. The linerless metallic closure of claim 9, wherein said concentration is about 45% by weight.

10 11. The linerless metallic closure of claim 6, wherein said plasticizer is at least one of a di-octyl phthalate (DOP), and a di-isodecyl phthalate (DIP) having a concentration in said composition varying between about 50 and about 55% by weight.

12. The linerless metallic closure of claim 11, wherein said concentration is about 52.5% by weight.

15 13. The linerless metallic closure of claim 11, wherein said DOP plasticizer has the following chemical formula:



14. The linerless metallic closure of claim 6, wherein said blowing agent is one of a azodicarbonamide (ADC), a modified azodicarbonamide (MADC), a
20 dinitrosopentametilentetramine (DNPT), a benzensulfonyl hydrazide (BSH), a 4,4-oxibisbenzene sulfonyl hydrazide (OBSh), a toluensulfonyl semicarbazide (TSSC), a 5-penyltrazole, a derived hydrazide, and a sodium bicarbonate (SBC).

15. The linerless metallic closure of claim 14, wherein a concentration of said
25 blowing agent in said composition varies from about 1 to about 5% by weight.

16. The linerless metallic closure of claim 15, wherein said composition is about 2.5% by weight.

5 17. A method for manufacturing a linerless metallic closure, comprising:
providing a metallic sheet having a top surface and a bottom surface;
applying a foaming material layer to one of said surfaces; and
forming said closure from said metallic sheet.

10 18. The method of claim 17, further comprising applying a coat of varnish to
said metallic sheet and curing said coat of varnish before said applying said foam
material layer.

15 19. The method of claim 18, further comprising transferring an ink to said
metallic sheet, so as to imprint thereon at least one of a brand logo, a producer logo, and
a promotional message, and curing said ink before said applying said foam material
layer.

20 20. The method of claim 19, wherein said foaming material layer foams during
a curing of said foaming material layer.

21. The method of claim 17, wherein said foaming material layer comprises a
combination of a vinyl resin, a plasticizer, and a blowing agent.

25 22. The method of claim 21, further comprising curing said foaming material
layer in an environment having a temperature varying from about 180 to about 220 °C.

23. The method of claim 22, wherein said temperature varies from about 192 to
about 198 °C.

30 24. The method of claim 22, wherein a curing time of said foaming material
layer in said environment varies from about 1.5 to about 5 minutes.

25. The method of claim 24, wherein said curing time varies from about 2 to about 2.5 minutes.

26. The method of claim 17, wherein a thickness of said foaming material layer
5 is between about 0.010 and 0.020 inches.

27. The method of claim 26, wherein said thickness is about 0.015 inches.

28. A method for manufacturing a linerless metallic closure, comprising:
10 providing a metallic sheet;
forming at least one closure shell from said metallic sheet, said at least one closure shell having a top portion and an annular side wall; and
applying a foaming material layer to an inner surface of said top portion.

15 29. A method for manufacturing a linerless metallic closure, comprising:
providing a roll-on metallic closure shell having a top portion and an annular side wall; and
applying a foaming material layer to an inner surface of said top portion.

20 30. The method of claim 29, wherein said applying further comprises applying said foaming material layers over an inner surface of said side wall.